

## PACKAGE WITH RETAINMENT MEANS

TECHNICAL FIELD

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The present invention relates to packages of the kind set forth in the preamble of claim 1 and more particularly to retainment means for preventing unintentional opening of a cover part of such packages.

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BACKGROUND OF THE INVENTION

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Packages of the above kind, i.e. packages formed by suction moulding of a fibrous material for receiving one or more frangible products to be packed, for instance eggs, are well-known within the art. Among these a large number of different packages specifically for eggs has been described. Such packages generally comprise a bottom part provided with a pattern of pocket-like compartments for accommodating the eggs and a cover part, which is often hingedly connected to the bottom part so that it can be swung between a closed and an open position. Most 20 such packages are furthermore provided with retainment means for releasably retaining the cover part in its closed position on the bottom part and a large number of different retainment means for this purpose has been described.

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Such retainment means are for instance disclosed in US 4,782,995 and US 5,860,528 and common for these means - and corresponding retainment means known from many other packages of the present kind - is the provision of dedicated retainment members on either cover part, bottom part or on both parts.

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A comparatively simple type of retainment means is described in EP 1 098 826 B1, said means comprising openings in the vicinity of the edge region of the front face of the cover part provided for releasable retainment with corresponding outwardly extending projecting members located on the bottom part. When the cover part closes on the bottom part, these outwardly projecting members enter into retaining engagement with a part of the periphery of said holes and by afterwards pulling 35 outwards and upwards in said edge region of the cover part it is possible to

disengage the projecting members from the holes, whereby it becomes possible to open the package.

The above packages suffer from different disadvantages. Thus, generally dedicated  
5 retainment means on both the cover part and the bottom part are required and at least in connection with the above-mentioned package disclosed in EP 1 098 826 B1 the retainment obtained is not always sufficiently reliable, partly due to the fact that the retainment openings in the cover part are placed in the vicinity of the edge region of the cover part, where the material does not always have the needed  
10 rigidity to ensure a reliable retainment of the cover part to the bottom part.

#### DISCLOSURE OF THE INVENTION

15 On the above background it is an object of the present invention to provide improved retainment of the cover part of a package to the bottom part hereof, the cover part and the bottom part of the package being hingedly connected to each other along an upper rim portion of the bottom part and a lower edge portion of the cover part.

20 Thus according to one aspect of the present invention there is provided a package formed by a suction moulding of a fibrous material for receiving one or more frangible products, such as eggs, comprising the following main parts:

25 - a bottom part comprising non-planar side surfaces so as to match at least partially the outer contours of the product(s) to be packed and provided with an upper rim portion or upper rim portions running along the upper edge region of the bottom part and extending outwards from the bottom part;

30 - a cover part comprising at least a top surface and a front surface which meet at an angle to form an edge;

- the bottom part being connected to the cover part by a hinge so as to allow the cover part to move between an open position and a closed position;

- the front surface of the cover part extending down from the edge and overlapping the non-planar side surface of the bottom part opposite the hinge when the cover part is in its closed position;

5 - where said cover part is provided with at least one inwardly extending protrusion for locking engagement with the upper rim portion of the bottom part when the package is being closed; and

10 - where the hinge is positioned above the level of the upper rim portion of the bottom part.

15 The provision of said inwardly extending protrusions for engagement with the upper rim portion of the bottom part is advantageous in that these protrusions are consequently placed further away from the free edge portion of the cover part, i.e. at positions of the cover part where the overall rigidity of the cover part is greater than in the vicinity of the free edge portion hereof.

20 Furthermore, by positioning the hinge portion above the level of the upper rim portion of the bottom part, the lateral cross sectional shape of the cover part becomes modified relative to the corresponding cross sectional shape of a cover part, in which the hinge portion was located at the rim portion, this modification in itself yielding an increased lateral rigidity of the cover part and hence a more secure retention of the cover part to the bottom part.

25 Furthermore this positioning of the hinge portion is advantageous in that it allows the retention protrusion(s) on the cover part to swing into its/their retaining position underneath the upper rim portion running along the upper edge region of the bottom part with only a slight deformation of the material of these corresponding retention portions during closing and opening of the package.

30 The package is preferably made of moulded pulp, although other materials of suitable resiliency could also be envisaged.

35 The present invention takes advantage of the presence on the bottom part of said upper rim portion or upper rim portions running along the upper edge region of the

bottom part and extending outwards from the bottom part. Such flange-like upper rim portions on the bottom part of packages of the kind dealt with in the present context are well known for instance from the above-mentioned documents and form a part of the bridging structure connecting the different pockets in the bottom part of egg trays, etc. According to the present invention this feature, i.e. the flange-like upper rim portion of the bottom part, can in an advantageous manner be utilised as one of the complementary retainment means mentioned above, the cover part being provided with suitable complementary protrusions, which during closing of the package are brought into retaining engagement with said upper rim portion. A specific embodiment of this mechanism is described in the detailed description of the invention.

The above-mentioned protrusion or protrusions of the cover part can in principle be positioned on the cover part at such positions that it/they is/are brought into engagement with said upper rim portion of the bottom part anywhere along this edge portion. As the edge portion typically only extends outwardly from the corresponding portion of the bottom part over a very limited distance in those regions of the bottom part, where the edge portion runs along the pockets in the bottom part it might, however, be advantageous to place the protrusions on the cover part such that during closing of the package they are brought into engagement with the upper rim portion of the bottom part in the regions between adjacent pockets. This will become immediately apparent from the following detailed description of the invention.

Although the possibility to use the unmodified flange-like upper rim portion of the bottom part as one of the complementary retainment means has been described as an advantageous embodiment of the principles of the invention it is, however, also possible to provide one or more separate flaps or the like on the flange-like upper rim portion. This possibility could for instance be utilised if for some reason it would be desirable to provide said protrusions on the cover part at places corresponding to engagement with the flange-like upper rim portion of the bottom part at places, where this portion only extends a short distance outwards from the bottom part, as for instance along the outer surface of the pockets, as described above.

Especially compared to the package disclosed in the above-mentioned document EP 1 098 826 B1 the retainment means according to the present invention offers a

simple and yet reliable solution to the problem of an occasionally unreliable retainment of the cover part to the bottom part of the package. Thus by placing the protrusions on the cover part for engagement with the flange-like upper rim portion of the bottom part, one of the complementary retainment means, i.e. the protrusions, necessarily becomes located further away from the lowermost edge region of the front surface of the cover part than in the package disclosed in EP 1 098 826 B1, i.e. in a region of the cover part with less transversal compliance (increased rigidity) than the corresponding retainment means in the cover part of the package according to EP 1 098 826 B1.

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As a different - and complementary - embodiment of retainment means according to the present invention it is also possible to provide the bottom part of the package with protrusions for locking engagement with co-operating means provided on the cover part. Thus according to this embodiment of the invention there is provided a package formed by suction moulding of a fibrous material for receiving one or more frangible products to be packed, such as eggs, comprising:

- a bottom part comprising non-planar side surfaces so as to match at least partially the outer contours of the product(s) to be packed and provided with an upper rim portion;
- a cover part comprising at least a top surface and a front surface which meet at an angle to form an edge;
- the bottom part (2) being connected to the cover part by a hinge so as to allow the cover part to move between an open position and a closed position;
- the front surface extending down from the edge and overlapping the non-planar side surface of the bottom part opposite the hinge when the cover part is in its closed position;

where the bottom part adjacent said upper rim portion is provided with at least one outwardly extending protrusion for locking engagement with co-operating means provided on the cover part and where said hinge (5) is positioned above the level of the upper rim portion (6) of the bottom part (2).

Specifically the co-operating means on the cover part of this embodiment is one or more openings in the front surface of the cover part, although other equivalent means may also be envisaged by a person skilled in the art.

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#### BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described in more detail with reference to the accompanying drawings, in which

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Figure 1 is a perspective view of an embodiment of a package shown in its open state and provided with mutually corresponding retainment means according to the present invention for retainment of the cover part to the bottom part of the package when the package is in the closed state;

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Figure 2A is a first perspective view of a preferred embodiment of a package provided with retainment means according to the present invention;

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Figure 2B is a second perspective view of the preferred embodiment of a package shown in Figure 2A and provided with retainment means according to the present invention;

Figure 2C is a perspective view of an embodiment of a package provided with retainment means according to the invention;

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Figure 3 is a side elevational view of a package in the open state and provided with retainment means according to the present invention;

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Figure 4 is another and more preferred package provided with retainment means according to the present invention; and

Figure 5 is a perspective view of a package provided with additional retainment flaps according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

In the following, a detailed description of a specific embodiment of the retainment means according to the invention is given with reference to exemplifying packages 5 comprising such means for the purpose of providing a reliable locking of the cover part of the package to the bottom part hereof, when the package is in its closed state.

Thus with reference to Fig. 1 there is shown a package 1 for eggs comprising bottom 10 parts 2 and cover parts 3 hingedly connected to each other by a hinge portion 5. The cover part 3 comprises a substantially planar top surface 16 and a substantially planar frontal side 4 which in the closed state of the package extends downwardly substantially over the entire height of the bottom part 2, i.e. down to the bottom level as indicated by reference numeral 15 in Figures 1 and 3.

15 The bottom part 2 of the package shown in Figure 1 comprises a total of 12 pockets for eggs, generally designated by 12. Along the upper edge of the bottom part 2 there extends an upper flange-like rim portion 6 defining the upper level of the bottom part itself. Elevated above this level, a hinge portion 5 connecting the bottom 20 part 2 and the cover part 3 is situated.

25 The upper flange-like rim portion 6 extends a few millimetres outwardly from the egg pockets 12 and bridges the gaps 13 formed between adjacent egg pockets. These bridging portions of the upper rim portion 6 are designated 6' in the Figures and the lower surface of one or more of these bridging portions 6' can advantageously be used as one of the mutually corresponding retainment means according to the present invention in a manner to be described below.

30 The inner surface of the frontal side 4 of the cover part 3 is according to this embodiment of the Invention provided with inwardly extending protrusions 7, the engagement surface 8 of which facing the top surface 16 of the cover part being substantially planar although other shapes of this surface - and of the protrusions 7 generally - would also be possible. When the cover part 2 is being closed the innermost part of the protrusions 7 passes over the corresponding outermost part of 35 the upper flange-like rim portion 6, this being possible due to the resiliency of the

frontal side 4, and the protrusions 7 enter the gap 13 under the corresponding bridging portion 6', whereby the engagement surface 8 of the protrusions enters into retaining engagement with the lower surface of the bridging portion 6' and retain the cover part 3 to the bottom part 2. In order to open the package again, the frontal side 4 of the cover part 3 is pulled in an outward direction, whereby the engagement between the protrusions 7 and the corresponding bridging portions 6' can be released.

Referring to Figures 2A and 2B there is shown a preferred embodiment of a package comprising retainment means according to the invention. This package is specifically designed to accommodate two rows of five eggs and comprises a single bottom part 2 and corresponding cover part 3. The package shown in Figures 2A and 2B comprises both the retaining protrusions 7 on the cover part and additionally the retainer means 10, 11 known from the initially cited European Patent No. 1 098 826. Furthermore, according to this embodiment of a package, the upper rim portion 6 of the bottom part 2 is provided with retainment flaps 25A and 25B for engagement with the corresponding protrusions 7 and the openings 10, respectively, provided on the cover part 3. These pairs of retainment flaps 25A, 25B are shown in Figure 2B.

Referring to Figure 2C an embodiment of a package is shown which only comprises the retainment protrusions 7 on the cover part 3 and the corresponding flaps 25A on the upper rim portion of the bottom part. This embodiment of a package is thus not provided with the retainment means known from the initially cited European Patent No. 1 098 826.

Referring now to Figure 3 there is shown a side elevational view of the package shown in Figure 1. The transition between the top surface 16 and the planar frontal side 4 takes in this package place via the rounded edge portion 17 and the protrusion 7 is seen to be located approximately midways between this edge portion 17 and the distal edge portion 21 of the frontal side 4.

A side elevational view of an alternative package is shown in Figure 4, in which the rounded edge portion 17 of the package shown in Figure 3 has been replaced by a

substantially planar edge region 20 longitudinally bounded by edge portions 18 and 19. The protrusion is in this case located in the vicinity of the edge portion 19.

Returning to Figure 1, the bottom part 2 and the cover part 3 are furthermore - as an 5 option - provided with those retainment means already known from the initially cited European Patent No. 1 098 826. The prime advantage of the retainment means according to the present invention becomes apparent by a comparison between the retainment means disclosed in EP 1 098 826 and those of the present invention.

10 The retainment means according to EP 1 098 826 comprises one or more rectangular holes 10 in the frontal side 4 and corresponding projections 11 placed on one or more of the pockets 12 of the bottom part 2. As apparent from Figures 3 and 4, these projections terminate downwardly in inclined portions 22 and when the cover part 3 is closed, a retaining engagement is established between these inclined 15 portions 22 and the corresponding edge portion 23 of the hole in the frontal side 4. The projections, however, only project a few millimetres - typically approximately 3 mm - outwards from the corresponding surface of the pocket 12 and a reliable retainment by these means requires that the frontal side 4 be substantially plane and not exhibiting an outwardly arched shape relative to the bottom part 2. In 20 practice, this requirement is not always fulfilled, and this has turned out to cause problems both during the packing process and in shops, where packages tend to open. These problems are solved by the retainment means according to the present invention.

25 Referring finally to Figure 5 there is shown an embodiment of retainment means as set forth in the invention according to which the flange-like upper edge 6 of the bottom part 2 is additionally provided with outwardly extending retainment flaps 25. Such flaps can - as described above - as one possibility be placed at the portions of 30 the upper edge 6 corresponding to the positions of the retainment openings 10 in the cover part 3, in which case they can serve as a supplementary retainment means to the retainment means provided by the openings 10 and the corresponding projections 11 on the bottom part 2, to the effect that when the engagement between the openings 10 and the projections 11 is released, the cover part will still be prevented from completely opening due to a subsequent engagement between 35 the openings 10 and the corresponding flaps 25. It is, however, also possible to

place the retainment flaps 25 in the regions of the upper edge 6 of the bottom part 2 between the pockets 12, i.e. in the regions designated 6' in the Figures, in which case the flaps may serve as a reinforcement of the engagement between the protrusions 7 on the cover part 3 and this portion 6' of the upper edge 6 of the 5 bottom part 2.

Although various embodiments of the present invention have been shown and described in the preceding parts of the detailed description, it is understood that a person skilled in the art may conceive other embodiments of the invention without 10 departing from the scope of the invention as defined by the following claims. As an example, various combinations of the retainment means described above may be utilised and appropriate numbers of corresponding retainment means and their placement on the cover part and the bottom part may be varied according to specific requirements. Also as described, retainment flaps can be provided as appropriate 15 on - or in the region about - the upper edge region of the bottom part. .

LIST OF REFERENCE NUMERALS

1. Package
2. Bottom part of package
- 5 3. Cover part of package
4. Front side of cover part
5. Hinge portion
6. Flange-like upper rim portion of bottom part
- 6' Flange-like upper rim portion of bottom part between egg pockets
- 10 7. Protrusions on cover part
8. Engagement surface of protrusion
9. Edge
10. Retainment opening in cover part
11. Retainment projection on bottom part
- 15 12. Pocket
13. Region between adjacent pockets
14. Opening
15. Underlying surface
16. Top surface
- 20 17. Rounded edge portion
18. Edge portion
19. Edge portion
20. Planar edge region
21. Distal edge portion of front side of cover part
- 25 22. Inclined portion on retainment projection
23. Edge portion of retainment opening
24. Side surface of bottom part opposite hinge portion
25. Retainment flaps